Utah Nursing Workforce Information Center

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RN Employment Demand 2020

The Utah Medical Education Council

State of Utah

umec-nursing.utah.gov

2020

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Executive Summary

Nursing demand can be defined in two ways: population demand and employer demand. Population demand deals with the consumption of services delivered by the healthcare system. It is a proxy for population need (ie: what services are required to address epidemiology/ health in the population, along with which healthcare professionals are most appropriate and available to deliver those services). Employer demand deals with staffing of the healthcare workforce to meet the needs of the service delivery model (clinic, hospital, etc..) Employer demand is determined by the payment model used by the delivery system. This study seeks to provide the most current information available about the employer demand for Registered Nurses in Utah.

This analysis provides a picture of RN employment demand in Utah over the time period from the first quarter of 2015 (January- March) to the second quarter of 2020 (April- June). It captures historical RN employment patterns over the most recent 5 year period. The timing of this analysis allows for an initial glimpse into the impacts of the Covid-19 pandemic on the Utah nursing workforce.

Key Findings

- Employers, on average, will demand between 819-1,131 new nurses annually over the next twelve months.
- Job listings for RNs in Utah peaked with 3,010 listings in the second quarter of 2017 and have been on the decline since.
- The decline in job listings has occurred in conjunction with increased nursing FTEs across the majority of nursing employers over the last 5 years. Employment of nurses has grown by an average of 29.7% among all nursing employers over the analysis time period.
- Intermountain Healthcare and the University of Utah employ the majority of the State's RN FTEs (an estimated 39.2% and 13.9% respectively).
- General, Medical, and Surgical Hospitals employ 52.7% of RNs in Utah. Followed by Colleges, Universities and Professional schools employing 15.1% of RNs (91.7% of these are employed by the University of Utah).
- Turnovers, defined as anytime an employee leaves an employer, are at an all time high of 3,123 for the second quarter of 2020. This is a 39% increase in the number of turnovers since the same time frame last year. These changes correlate with the economic downturn in response to the pandemic.
- Analysis of hiring data projects that on average, after 9 quarters (2 years since hire date) 36% of RNs are still with the same employer.

Background

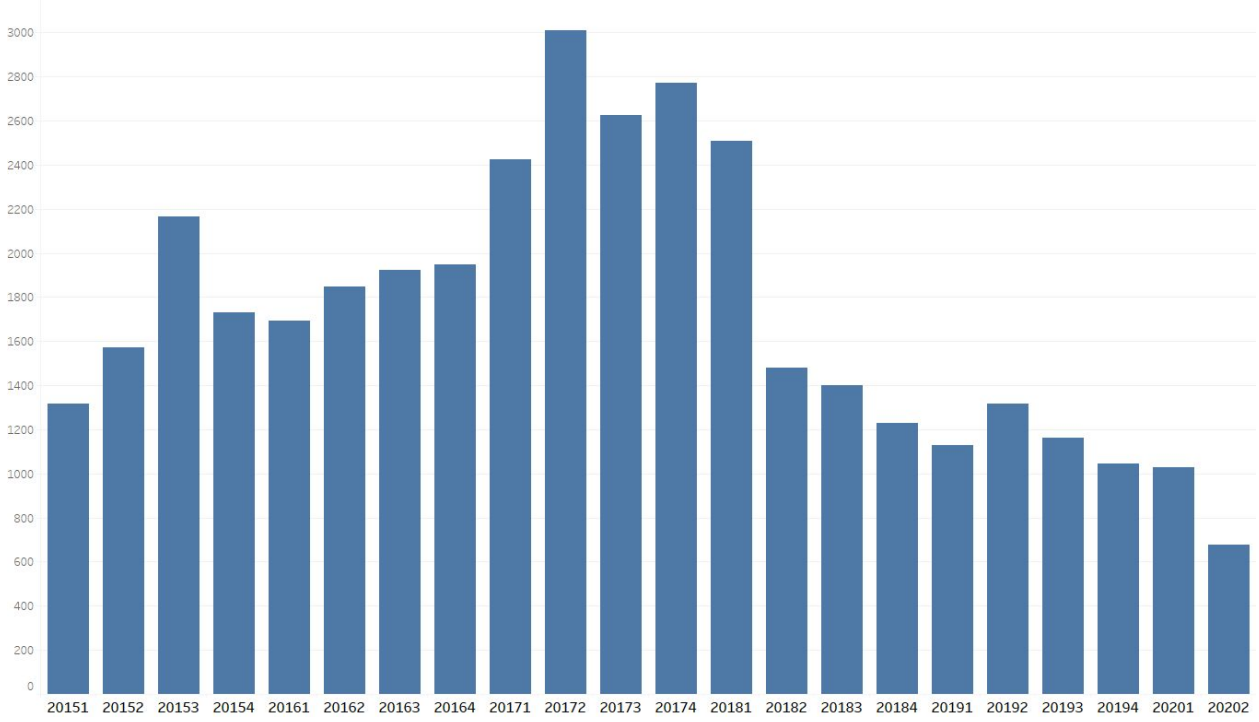
In 2013, the Utah legislature expanded the Utah Medical Education Council (UMEC) health care workforce research responsibilities to include nursing. In association with its enlarged legislative mandate, the UMEC has accepted the designation as the Utah Nursing Workforce Information Center (UNWIC) and has become an active member of the Utah Action Coalition for Health (UACH). The UNWIC has developed an RN/ LPN workforce supply survey and a nursing education survey of all institutions in the state providing nursing education. The UNIWC has conducted in-depth surveys to support national efforts by the National Council of State Boards of Nursing and the National Forum of State Nursing Workforce Centers to gather minimum data sets in supply, demand and education for nursing in the United States.

In 2018, the Utah legislature passed S.B. 147 entitled “Nursing Initiative”. This bill amended section 53B-24-303 Duties of council, of the Utah Medical Education Council Act and added section 53B-26-201 and 202. This amendment requires the Utah Medical Education Council to project the demand for individuals to enter a nursing profession. The statute states;

> Every even-numbered year, the Medical Education Council shall:
> (a) project the demand, by license classification, for individuals to enter a nursing profession in each region;
> (b) receive input from at least one medical association in developing the projections described in Subsection (1)(a); and
> (c) report the projections described in Subsection (1)(a) to:
> (i) the board; and
> (ii) the Higher Education Appropriations Subcommittee.

2020 Baseline Analysis Results- Utah RN Employment Demand

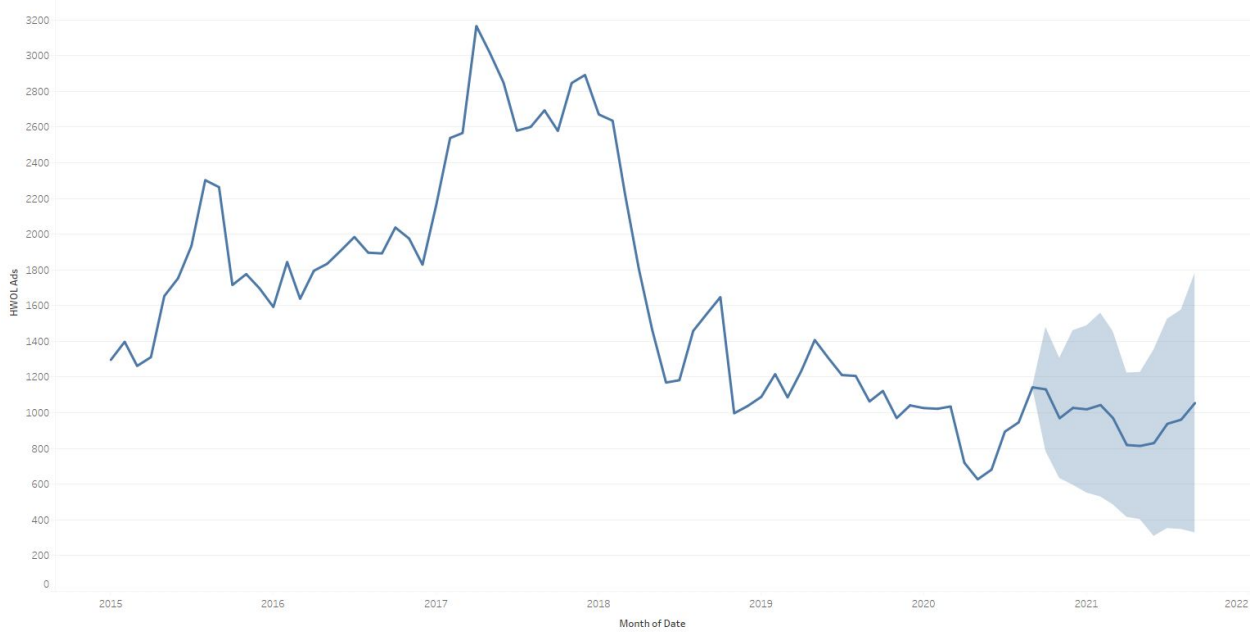
Figure 1: HWOL Job Listings for RNs 1st Quarter 2015 to 2nd Quarter 2020



Over the last 5 years there has been an ebb and flow of online job listings for RNs in Utah. Data from the Department of Workforce Services Help Wanted Online ads (HWOL)[1] shows that the number of online job listings for RNs in Utah peaked with 3,010 listings in the second quarter of 2017 and has been on the decline since. The pattern over the last three years has been a peak in the number of listings in the second quarter of each year and the lowest number of listings in the first quarter of the following year. The number of job listings for the first quarter of 2020 was in line with the level from the first quarter of 2019. However, if listings had followed the established pattern, there should have been an increase in the number of listings in the second quarter of 2020. Instead the number of job listings for RNs decreased. The most recent declines in the number of online postings correlate with the economic downturn in response to the pandemic.

[1] http://www.dws.state.ut.us/wi/data/library/occupation/hwoltopjobs.html

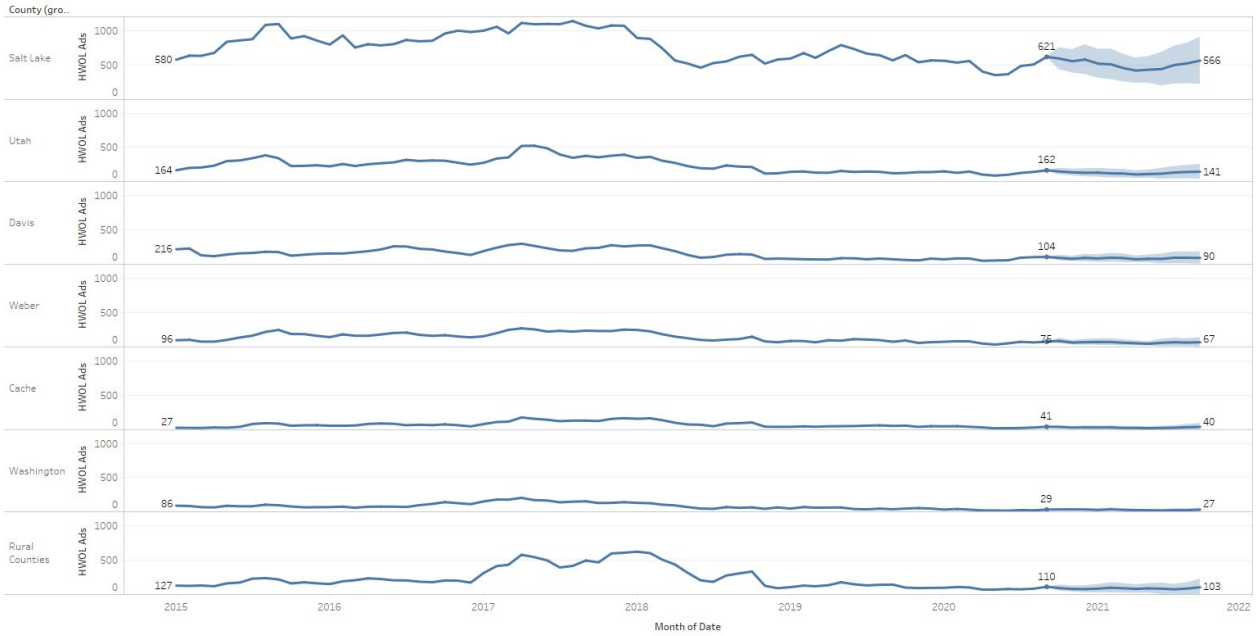
Figure 2: Projected Demand for RNs in 2021- Forecast Using Historical Data



The demand of nurses can be projected in the next 12 months using historical data from HWOL job listings. This projection estimates there will be about 1,054 job listings by September 2022 with a 95% confidence interval of 1780 for the upper bound and 328 for the lower bound. This projection shows gradual increases and decreases over the next 12 months, ranging from 819-1131 job listings. In order to project this demand of nurses, HWOL listings from previous years were forecasted through computations using exponential smoothing. The exponential smoothing algorithm incorporates variations of HWOL historical data through weighted averages from past job listings. For our projection, we used a multiplicative model[2] where components and values from the job listings are multiplied to get a combined effect with predicted estimates over the next 12 months.

[2] Projection generated by forecasting feature in Tableau data visualization software. https://help.tableau.com/current/pro/desktop/en-us/forecast_how_it_works.htm

Figure 3: HWOL Listings Trendlines by County 2015-2020



Breaking down HWOL job listings by county shows that there have been declines in the number of listings in all Urban counties since 2015. Rural counties have followed a similar pattern to urban counties only on a smaller scale. Ultimately the number of job listings online for nursing employment in Utah have declined in the last few years. However, this has occurred in conjunction with increased nursing FTEs across the majority of nursing employers over the same time as demonstrated in Table 1. Employment of nurses has grown by an average of 29.7% among all nursing employers over the analysis time period. Projections for HWOL job listings by county shows there will be gradual decreases over the next two years, with Salt Lake and Utah counties seeing less job listings compared to other urban and rural counties.

Table 1: 2020 FT/PT & FTE Estimates and difference since 2015 by Employer[3]

Employer	Full-Time	Part-Time	Part-Time%	FTE Estimate	FTE Change Since 2015	% Change since 2015
INTERMOUNTAIN HEALTH CARE, INC.	6,850	4,295	38.54%	9,472	1,909	25%
UNIVERSITY OF UTAH	3,037	726	19.29%	3,363	942	39%
NORTHERN UTAH HEALTHCARE CORPORATION	318	340	51.67%	540	-36	-6%
IASIS HEALTHCARE HOLDINGS, INC. GP ET AL	284	306	51.86%	440	66	18%
STATE OF UTAH	316	68	17.71%	341	11	3%
COLUMBIA OGDEN MEDICAL CENTER, INC.	204	185	47.56%	313	20	7%
TIMPANOGOS REGIONAL MEDICAL SERVICES, INC.	132	236	64.13%	263	32	14%
DAVIS HOSPITAL & MEDICAL CENTER, LP	162	186	53.45%	262	27	12%
HOSPITAL CORPORATION OF UTAH	111	112	50.22%	181	13	7%
SALT LAKE REGIONAL MEDICAL CENTER, INC.	95	89	48.37%	138	-16	-10%
SELECTHEALTH, INC	125	22	14.97%	138	40	41%
MOUNTAIN VIEW HOSPITAL, INC.	84	89	51.45%	135	135	
COMMUNITY NURSING SERVICE	95	86	47.51%	124	9	7%
SALT LAKE COUNTY	114	11	8.80%	119	-1	-1%
RESOURCE MANAGEMENT, INC.	64	138	68.32%	117	35	42%
LONE PEAK HOSPITAL, INC	75	94	55.62%	112	38	50%
UINTAH BASIN MEDICAL CENTER	85	44	34.11%	109	12	13%
HOME CAREGIVERS PARTNERSHIP, LLC	81	68	45.64%	106	75	238%
UTAH COUNTY GOVERNMENT	82	46	35.94%	102	27	35%
CENTRAL UTAH CLINIC, P.C.	72	53	42.40%	97	26	37%
SOUTH DAVIS COMMUNITY HOSPITAL	48	83	63.36%	95	-13	-12%
TOOELE HOSPITAL CORPORATION	70	40	36.36%	93	4	5%
CASTLEVIEW HOSPITAL, LLC	53	59	52.68%	84	84	
ASH VALLEY MEDICAL CENTER, LLC	51	45	46.88%	74	74	
UHS OF PROVO CANYON, INC.	52	44	45.83%	72	11	17%
COTIVITI, INC.	63	12	16.00%	68	68	
OPTUM SERVICES, INC.	64	5	7.25%	66	48	266%
SALT LAKE BEHAVIORAL HEALTH, LLC	55	29	34.52%	65	17	36%
LIBERTY DIALYSIS GROUP, LLC	57	11	16.18%	64	4	7%
HELPSIDE IW INC	51	28	35.44%	63	63	
SILVER LAKE HEALTHCARE, INC.	41	46	52.87%	60	29	90%
MOAB VALLEY HEALTHCARE, INC.	52	19	26.76%	59	14	31%
HOME HEALTH SPECIALISTS, LLC	30	77	71.96%	58	-1	-2%
CENTRAL VALLEY MEDICAL CENTER	46	29	38.67%	57	3	6%
AETNA RESOURCES LLC	56	1	1.75%	57	57	
SUTTER HEALTH	31	41	56.94%	57	57	
MOUNTAIN DIVISION, INC.	45	21	31.82%	56	29	105%
KPC PROMISE HOSPITAL OF SALT LAKE, LLC	38	38	50.00%	55	55	
IVY LANE PEDIATRICS INC	19	96	83.48%	54	-21	-28%
BRIGHAM CITY COMMUNITY HOSPITAL, INC.	30	47	61.04%	53	53	
WEBER STATE UNIVERSITY	49	10	16.95%	52	7	15%
OGDEN CLINIC PROFESSIONAL CORPORATION	43	35	44.87%	52	26	103%
AMERITECH COLLEGE, LLC	39	28	41.79%	50	50	
SUCCESSOR HEALTHCARE LLC	36	31	46.27%	49	9	22%
MOUNTAIN DIVISION - CVH, LLC	22	57	72.15%	48	5	12%
PARALLON ENTERPRISES, LLC	37	70	65.42%	47	23	100%
HARMONY HOME HEALTH SERVICES, LIMITED LIABILITY CO	24	54	69.23%	45	-25	-36%
UTAH VALLEY SPECIALTY HOSPITAL, INC.	32	26	44.83%	44	-10	-19%
UTAH CANCER SPECIALISTS, P.C.	33	18	35.29%	43	12	41%
BRISTOL HOSPICE LLC	39	8	17.02%	42	39	1,303%
VALI DIVISION OF WASATCH	31	35	53.03%	42	15	55%
IASIS MANAGEMENT COMPANY	30	20	40.00%	41	33	414%
SUTTER VISITING NURSE ASSOCIATION AND HOSPICE	27	32	54.24%	41	12	43%
ENCOMPASS HEALTH REHABILITATION HOSPITAL OF UTAH,	29	25	46.30%	40	40	
BRIGHAM YOUNG UNIVERSITY	34	38	52.78%	40	-12	-23%

[3] List limited to employers with 40 or more FTEs in the second quarter of 2020.

Intermountain Healthcare and the University of Utah are the State's largest employers of RNs (employing an estimated 39.2% and 13.9% respectively of the State's RN workforce)[4]. UMEC workforce supply survey data is used to determine estimates of the numbers employed full time and part time at each employer.

Table 2: RN Employers by NAICS[5] Code

NAICS Name (group)	NAICS Code..	
General Medical and Surgical Hospitals	622110	52.71%
Colleges, Universities, and Professional Schools	611310	15.19%
Nursing Care Facilities (Skilled Nursing Facilities)	623110	5.41%
Home Health Care Services	621610	5.12%
Offices of Physicians (except Mental Health Specialists)	621111	3.67%
Outpatient Care	6214..	1.77%
Specialty (except Psychiatric and Substance Abuse) Hospitals	622310	0.50%
Offices of All Other Miscellaneous Health Practitioners	621399	0.49%
Psychiatric and Substance Abuse Hospitals	622210	0.40%
All Other Miscellaneous Ambulatory Health Care Services	621999	0.07%

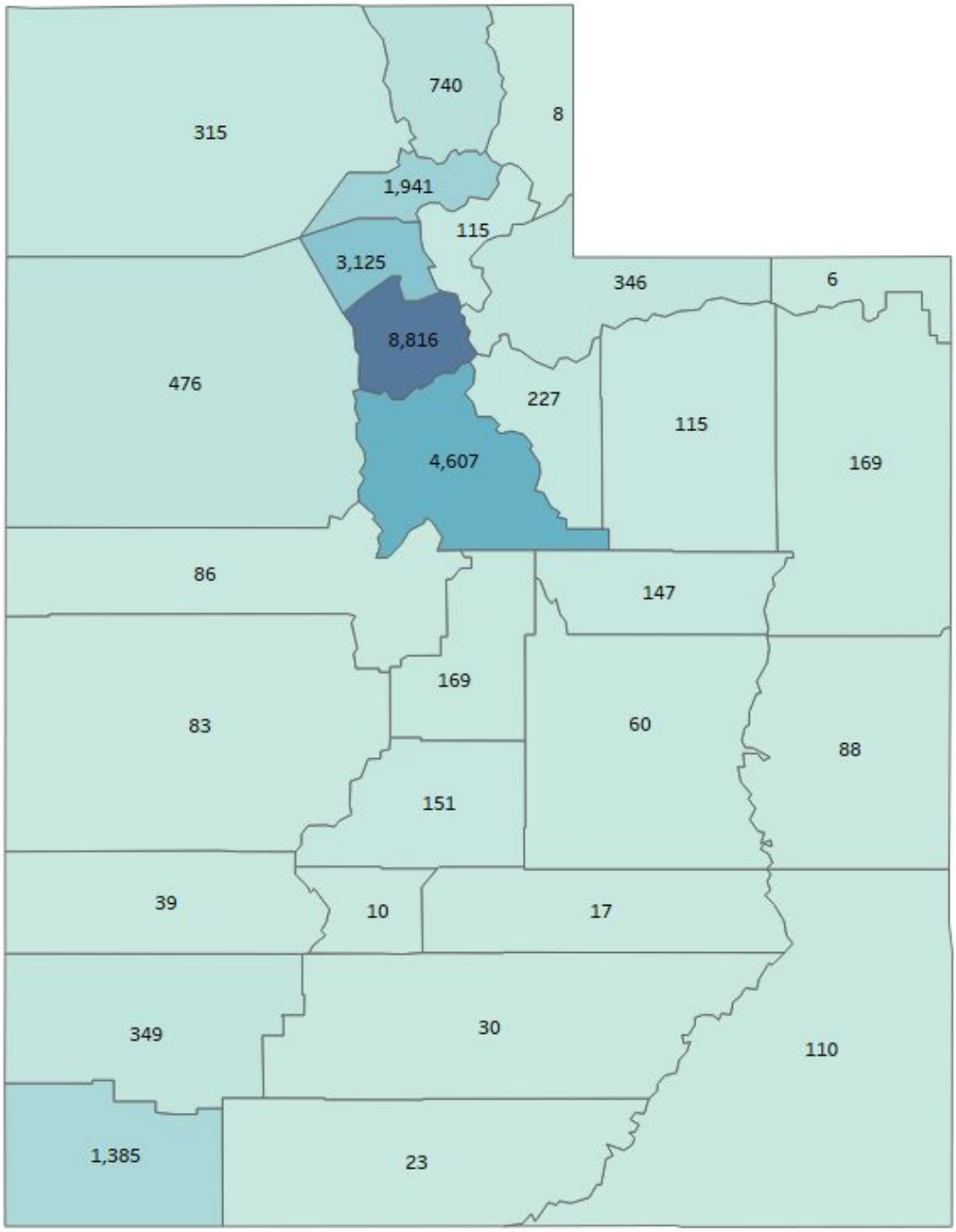
General, Medical, and Surgical Hospitals is the largest employer NAICS group[6] making up 52.7% of all FTEs in the state. Colleges, Universities and Professional schools make up 15.2% of FTEs in the state (the University of Utah/ University of Utah Health making up 91.7% of the FTEs in this NAICS category). Nursing Care Facilities, Home Health, and Offices of Physicians make up the remainder of the Top 5. These 5 NAICS codes employ 80% of FTEs in the state.

[4] An interactive table with additional analysis including % of total FTEs by employer and ability to sort and filter will be available at nursing-umec.utah.gov for inspection.

[5] United States Census Bureau. North American Industry Classification System (NAICS). The standard used by Federal statistical agencies in classifying business establishments for the purpose of collecting, analyzing, and publishing statistical data related to the U.S. business economy. Retrieved 2020, from http://www.census.gov/eos/www/naics/

[6] 622110

Figure 4: RN FTEs by County Provided on Utah License Address



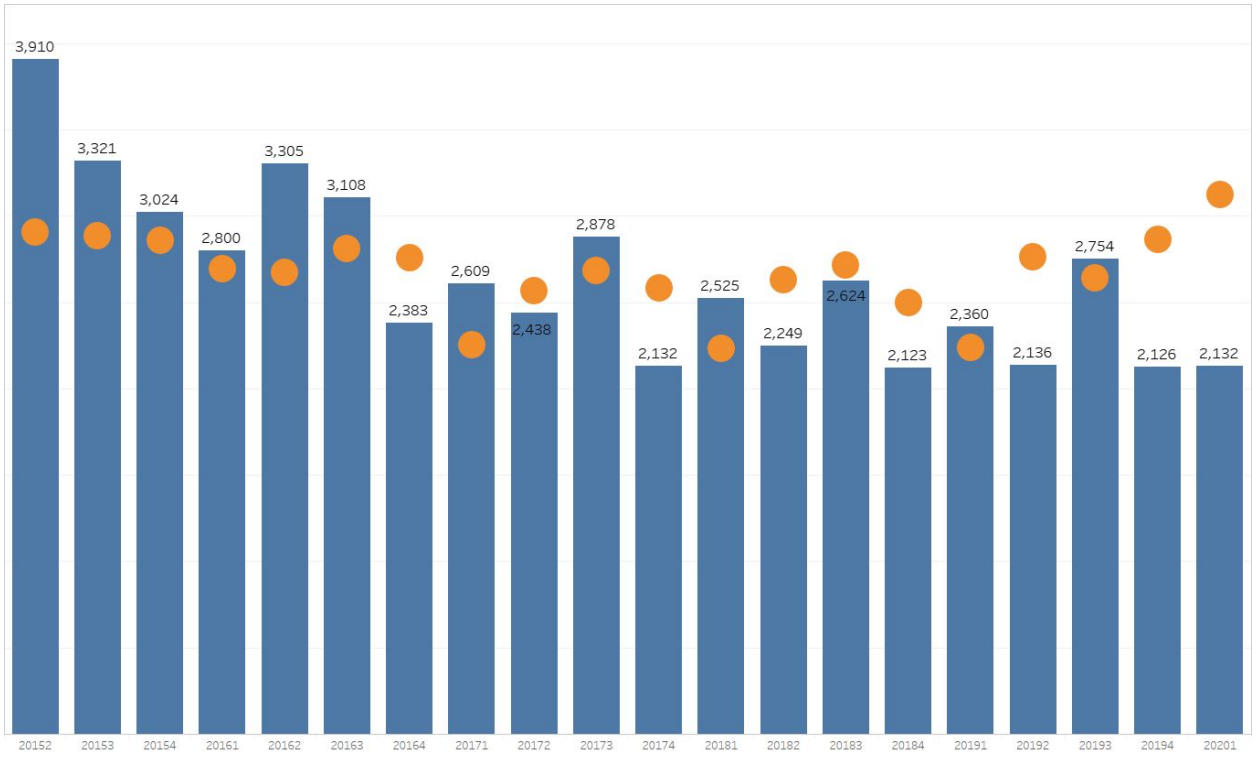
Data from the address provided to DOPL on each license was used to determine practice locations for RNs throughout the state. Employer addresses from UI data could not be used to determine practice location since often the address for the employer is a centralized HR address. RNs in Salt Lake, Utah, Davis, Weber, Cache and Washington counties make up 86% of Utah's RN workforce FTEs.

Comparing New Hires and Turnover Trends

Turnovers are defined in this report as anytime an employee leaves an employer. Turnovers are calculated by finding the last time in the UI data that an employer/employee combination appeared excluding the final quarter (2020-2).

New Hires are defined in this report as anytime an employee began working for an employer. New Hires are calculated by finding the first quarter an employee/employer combination appeared in the UI data after the first quarter of 2015.

Figure 5: New Hires (Bars) vs Turnovers (Dots) of Utah RNs 2015- 2020[7]



Excluding the high point at the beginning of the analysis frame in the second quarter of 2015, the lowest number of new hires on average occurs annually in the third quarter (averaging 2,358 new hires in that quarter per year). Over a five year period the number of new hires in the lowest hiring quarter has declined year over year on average by -8%. Year over year there has been a pattern on average of lowest RN turnovers annually in the first quarter of each year (averaging 2,382 per year in this quarter over 5 years). The pattern has also been that the highest number of new hires has occurred in the second quarter of each year (annually averaging 2,937 per year). The number of new hires in the second quarter has seen an average annual decline of -4.4% over the analysis time frame. For turnovers, the average annual high point has been in

[7] Counts provided for New Hires (bars) are found in Figure 4. Counts for turnovers (dots) are reported in Figure 5 for ease of reading.

the third quarter (annual average of 2,747 turnovers). There has been an annual average decline in turnovers in the third quarter of -2.1% over the last 5 years.

Table 3: Average Annual New Hires, Turnovers and % Change by Quarter 2015-2020

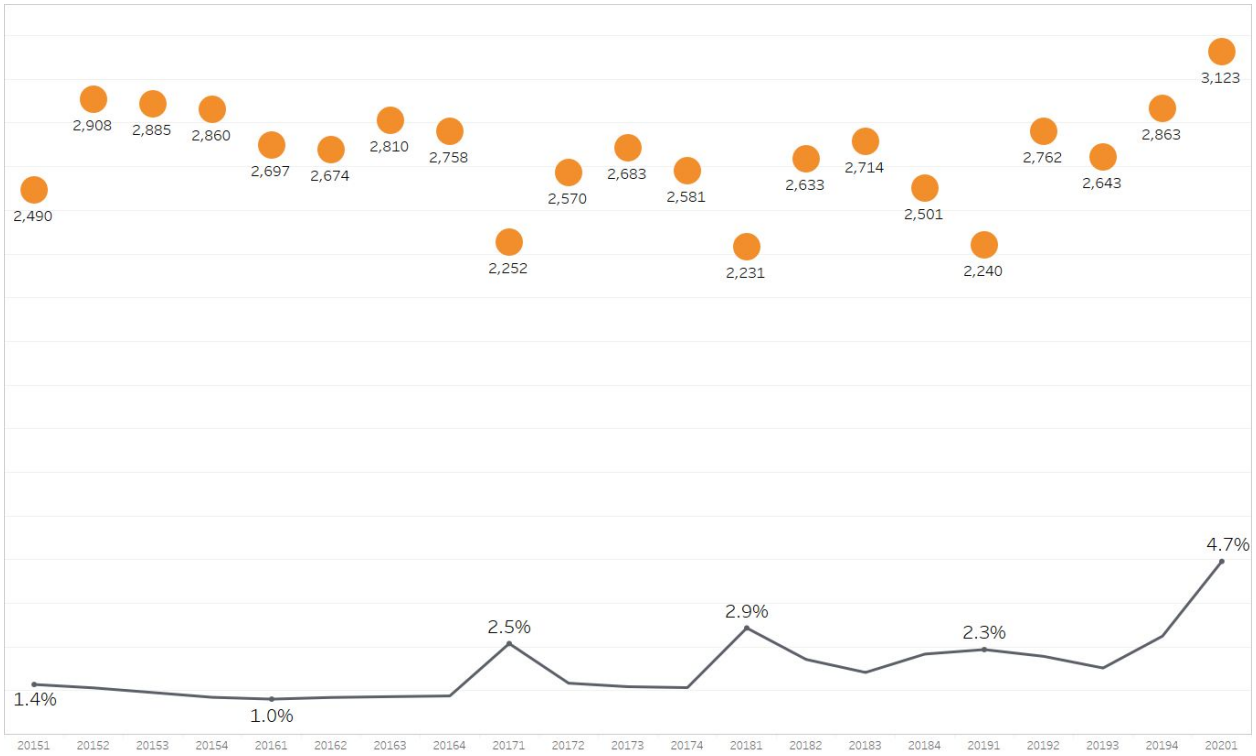
Quarter	New Hires	NH % change	Turnovers	T % change
1	2,532	-13.00%	2,382	-2.18%
2	2,937	-4.42%	2,709	-1.15%
3	2,358	-8.00%	2,747	-2.14%
4	2,485	-6.56%	2,713	0.35%

Looking at the two most recent quarters (q1 and q2 for 2020), new hires dropped off after a peak in the third quarter of 2019 as expected from the pattern of the last few years. New hires are at the lowest point for the first quarter than they have been in 5 years. Turnovers, which should have begun to drop after their typical peak in the third quarter, have continued to rise over the first two quarters of 2020. Turnover numbers are currently at an all time high of 3,123 for the second quarter of 2020. This constitutes a 39.4% increase in turnovers since the same quarter last year. These changes correlate with the economic downturn in response to the pandemic. It will be important to continue to track changes in turnovers and new hires in the near future in order to maintain a pulse on the impact of the pandemic on the state's RN workforce.

Nurse Retirement

This analysis shows that much of the recent change in turnovers is likely due to nurses retiring. In order to estimate retirements, the number of people that left the workforce needed to be calculated. People that were a turnover, and didn't have another instance of employment later in the UI data were considered people that had left the workforce. Using the DOPL data to get ages, those people that left the workforce and were over the age of 65 were considered to be retired. This number was then compared against the number of overall turnovers as shown in the chart below.

Figure 6: Turnovers (Dots) and Estimated Share of Turnovers as Retirements (Line) by Quarter 2015-2020



In previous years, the peaks in percent of turnovers as retirements may have been caused by the overall decrease in turnovers. Given a similar number of retirements, but fewer turnovers, this would increase the percentage, as shown in quarters 2017-1 and 2018-1. However, in 2020-1, Retirements make up a larger portion (4.7%) of the largest number of turnovers in any quarter over the last 5 years (3,123).

Figure 7: Length of Time with Employer by Quarterly Hiring Cohort Q1 2015 - Q2 2020

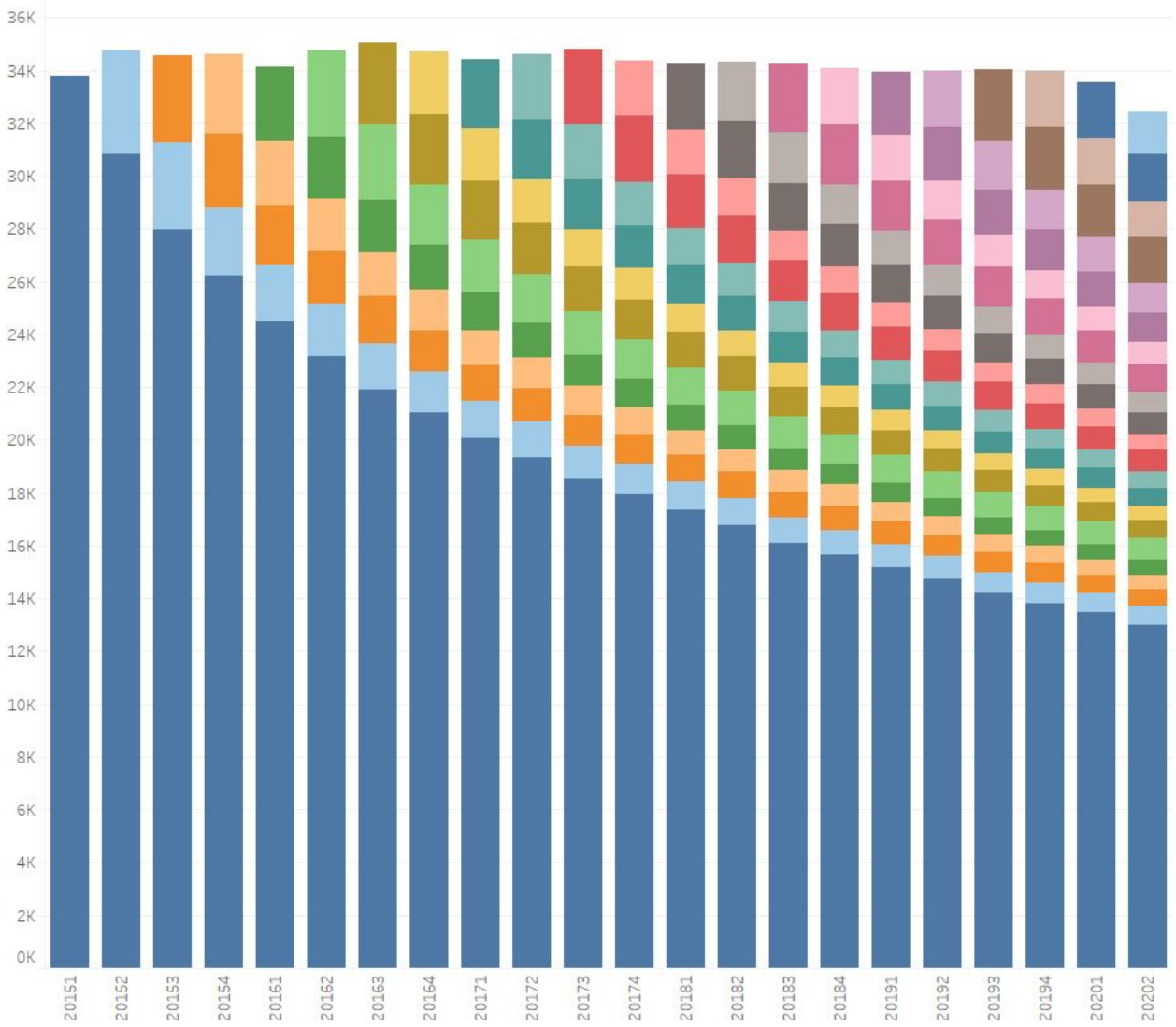
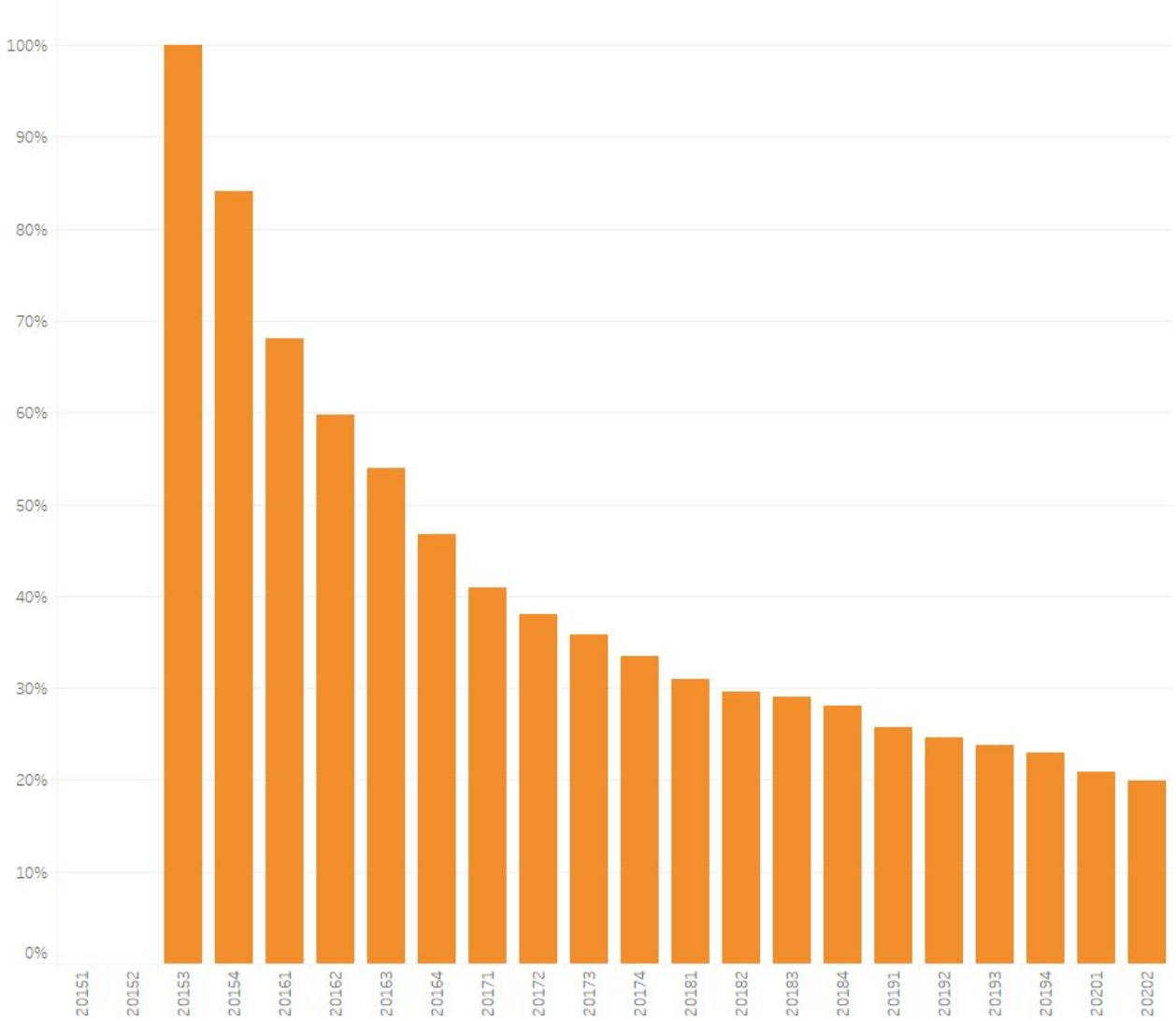


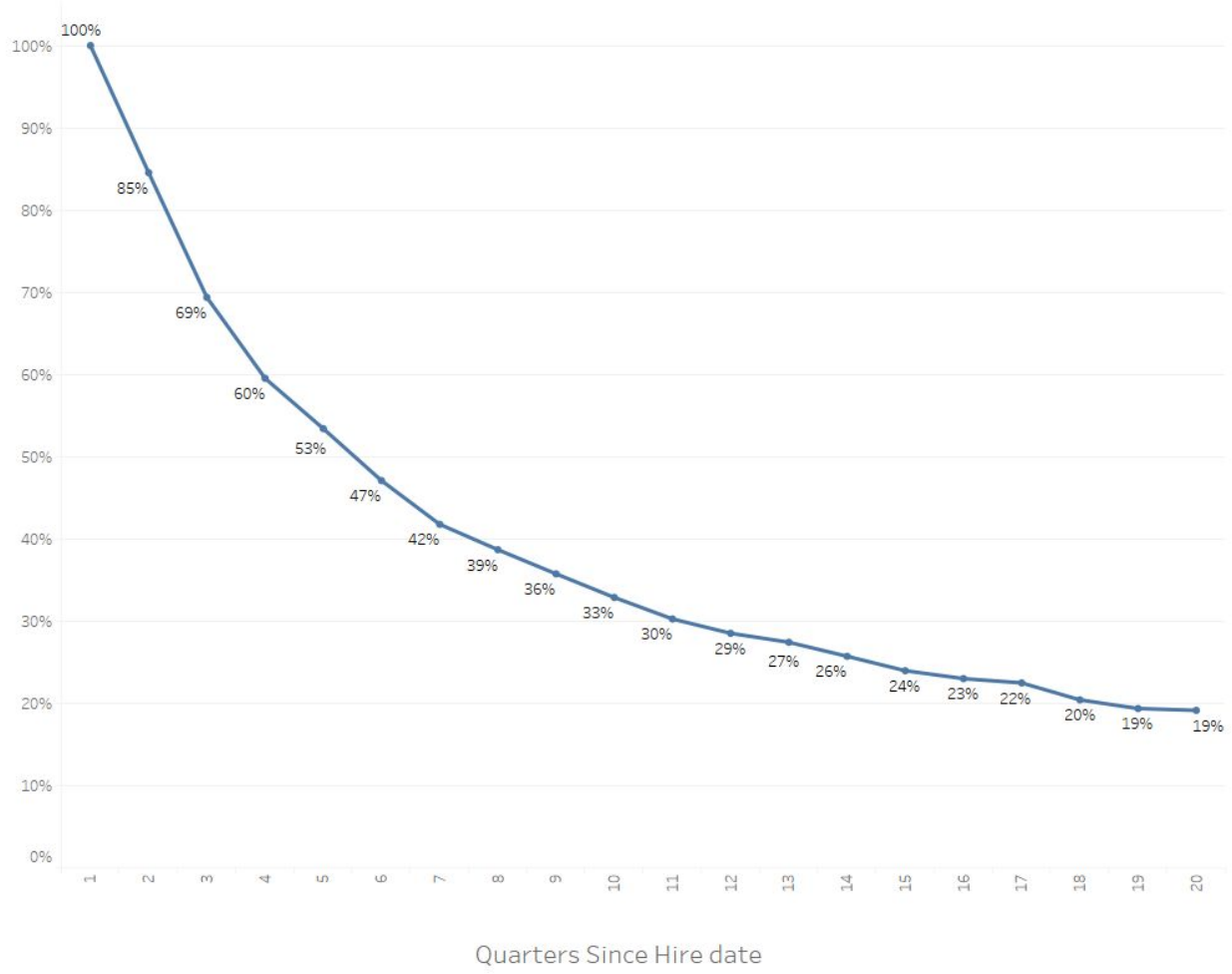
Figure 7 shows the length of time with the same employer for each cohort of RN new hires by quarter from the first quarter of 2015 to the second quarter of 2020. The various colors are each hiring cohort by quarter for all RNs hired in a given quarter who are still with the employer they were with when hired (or with which employer they were with in the first quarter of 2015 where the analysis frame begins). Focusing on one color, such as orange which is the employment cohort for the third quarter of 2015, shows what percentage of the workforce were still with the same employer they started with in every additional quarter moving forward in time.

Figure 8: Third Quarter 2015 RN Hire Cohort



For the hiring cohort from the third quarter of 2015 at 100% employed by the employer they were employed by in that quarter, 84.1% of that cohort were still employed by the same employer in the following quarter. Looking two years later in the fourth quarter of 2017, 33.5% of this cohort were still employed by the same employer. Two years after that in the fourth quarter of 2019, 22.9% were still employed by the same employer they were with in the third quarter of 2015. An interactive version of this analysis that will allow for inspection of each cohort by NAICS categories and time will be available on the UNWIC website after this analysis has been published in print form.

Figure 9: Average Attrition by Number of Quarters Since Hire Date



Taking the average attrition rate by quarter for each hiring cohort in Figure 7 (each of the colors representing a cohort) produces an aggregated attrition curve to project likelihood of an RN hired in a given quarter still being employed with the same employer a specific number of quarters after hire data. After 9 quarters (2 years since hire date) on average 36% of RNs are still with the same employer. After 20 quarters 19% of RNs on average are with the same employer. This analysis must be interpreted with the caveat that research into this type of projection estimation shows that root mean square error of the projection increases with each projected interval by as much as .9%[8] In other words, accuracy of this projection declines by nearly one percent each quarter. Thus it is most useful for predicting future workforce trends in the near term rather than the long term.

[8] Population and Development Review, Vol. 7, No. 4 (Dec., 1981), pp. 579-593

History of Nursing Demand Studies in Utah

In 2014, the Utah Hospital Association approached the UNWIC about conducting an employer demand study of Utah's nursing workforce. A survey methodology was developed based on a process being followed by several other states across the country to measure nursing employment demand. Survey questions were based on recommendations from the National Forum of State Nursing Workforce Centers Demand Minimum Data Set (MDS).[9] The Forum Demand MDS is a tool developed by collaboration among many states to determine a standardized set of questions considered important for demand forecasting and support of policy making in nursing at the state level.

The survey was sent out to all healthcare facilities employing nurses based on a list of nursing employers created from State Unemployment Insurance records. Employers were categorized by their respective North American Industry Classification System code (NAICS). This list included the following NAICS codes:
General Medical and Surgical Hospitals (622110),
Psychiatric and Substance Abuse Hospitals (62210),
Specialty Hospitals (622310),
Skilled Nursing Facilities (623110),
Home Health Care Services (621610),
Ambulatory Care (621999),
Office of Miscellaneous Health Practitioners (621399),
Office of Physicians (621111),
Outpatient Care (6214..)[10].
The employer list was then cross-referenced with industry specific lists from the Utah Hospital Association[11] and the Utah Department of Health.[12]

High response rates to this survey by employers were sufficient to impute survey non-response by NAICS category and produce a snapshot of nurse employer demand for the beginning of the year 2015. This survey process was repeated in 2017 and produced similar results. Publications of the analysis for these surveys are available on the Utah Nursing Workforce Information Center website[13]

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[9] National Forum of State Nursing Workforce Centers Nursing Workforce Minimum Data Set: Demand https://wbl.742.myftpupload.com/wp-content/uploads/2016/06/Nurse_Demand_Dataset.pdf
[10] Includes freestanding ambulatory surgical and emergency centers (93), All other outpatient care centers (98), Kidney Dialysis Centers (92), Outpatient Mental Health and Substance Abuse Centers (20), HMO Medical Centers (91), Family Planning Centers (10)
[11] Utah Hospital Association - UHA Members. Retrieved 2015, from http://www.utahhospitals.org/member-hospital
[12] UtahStateLicensedFacilityListing.UtahDepartmentofHealth.RetrievedJanuary7,2015,from http://health.utah.gov/hflcra/facinfo/factype.ph
[13] 2015 Nursing Demand Report- https://umec-nursing.utah.gov/wp-content/uploads/Demand-for-Nurses-in-Utah-FINAL.pdf
2018 Nursing Demand Report- https://umec-nursing.utah.gov/wp-content/uploads/NurseDemand2018.pdf

Table 4: Past Results of State Nursing Demand Studies with Survey Methodologies

Response Rates by Employment Setting (NAICS code)					
States	General Hospitals	Skilled Nursing/ Long-Term Care	Assisted Living Center	Public Health	Home Health/ Hospice
UTAH 2015	77%	35%	50%	75%	35%
UTAH 2017	79%	35%	34%	87%	36%
FLORIDA 2014[14]	40%	23%	---	57%	35%
LOUISIANA 2015[15]	56%	47%	---	100%	48%
OREGON 2011[16]	47%	32%	---	62%	35%

Limitations of Survey Methodology

While the studies in 2015 and 2017 produced statistically valid results they are of limited power in their ability to describe nursing employment demand. Employer surveys require a great deal of time and effort. Paper survey instruments must be mailed to each employer. Often the address available for mailing is not necessarily the address of the department within each employer that would be able to answer the survey questions. This requires that employers take the time to determine who within their organization should gather the information required to fill out the survey. This may involve the time of a Chief Nursing Officer (CNO) coordinating data from various departments within a hospital or an HR director deciding that the survey is even worth taking the time to respond to. Coordinating survey mailing, follow ups to increase response rates, scanning survey responses, cleaning the resulting data and producing a report of the analysis is a process that takes a year to complete. This delay makes it difficult to identify emerging trends or deal with issues that may arise within the workforce in a timely manner. A sample survey also results in different respondents in different years making it less possible to create an accurate longitudinal trend analysis. This process is also only able to gather information for one profession at a time. It is not easily scalable to include other professions.

Requirements for Process Improvement

With the addition of sections 53B-26-201 and 202, the UNWIC sought to improve the methodology for it's demand studies. In order to meet the requirements of the legislation, the UNWIC wanted to create a study methodology capable of producing regular and consistent information to describe longitudinal trends, early signals of change in occupations, skills and roles needed. The study methodology needed to be able to rapidly disseminate useful, timely

[14] DemandforNursesinFlorida:The2013SurveyofNurseEmployers.(2014).FloridaCenterfor Nursing. Retrieved January 4, 2015, from http://www.flcenterfornursing.org/

[15] NursingWorkforceDemandReport.(2012,March1).LouisianaCenterforNursing.Retrieved August 4, 2015, from http://lcn.lsbn.state.la.us /Portals/

[16] Oregon Center for Nursing. (2011). Nurses Wanted: The Changing Demand for Registered Nurses in Oregon. Portland, OR: Oregon Center for Nursing.

information and be scalable for possible future analysis of other professions/ settings. The UNWIC also sought to automate and standardize the process so that it was not dependent on employer mailing lists, HR reps and CNO's that change over time.

New Process

The new process replaces survey collection with analysis of available data sets that already exist within state government. This data is used to populate a series of dashboards that have been developed by the UMEC to describe RN employment demand at any given time and track seasonal cycles and emerging trends as they occur.

The process starts with a list of all active health profession licenses from the Utah Department of Occupational and Professional Licensing (DOPL).

Table 5: DOPL Variables for use in Demand Study

Name	Description
Profession Name	Grouping of professions by workforce (ex: RN, LPN are in the nursing profession)
License Name	Distinction between licenses in the profession. RN vs LPN
License Number	License ID combined with license type
Status	Status of that license
Issue	Date of issuance
Expiration	Date of expiration
Gender	Gender of the worker
DOB	Date of Birth of the Worker
SSN	Social Security Number
Zip	Zip code of address attached to the license*

*it is assumed that the address provided for each license is their home address. However, many individuals provide their employers address on their license application. It is impossible to know the home address for some applicants.

Through a memorandum of understanding established between the UMEC and the Utah Department of Workforce Services (DWS). The SSN for each licensed health professional is matched to wage records from the state Unemployment Insurance (UI) system.

Table 6: UI Variables for use in Demand Study

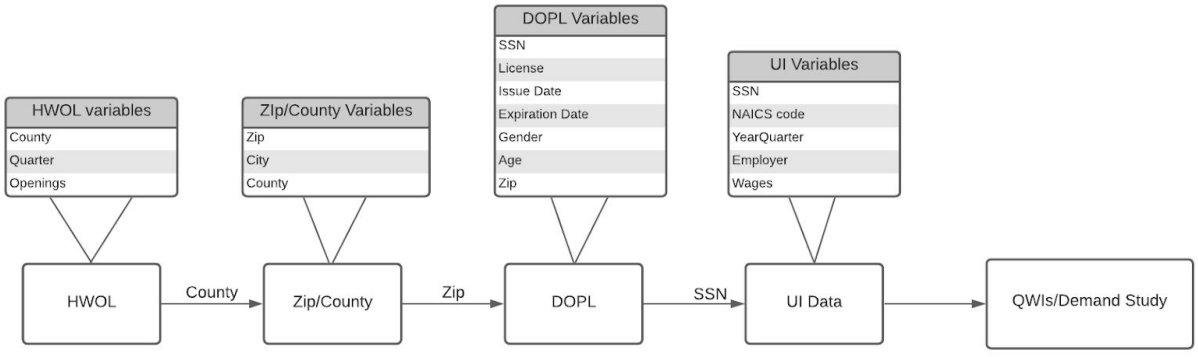
SSN	Social Security Number
Employer	Name of Employer/HR department
NAICS CD	Naics Code for this employer
NAICS NAME	Naics Description
Address	Address of HR department for this employer*
YearQuarter	Combination of Year and quarter in the format of YYYYQ
Wages	Average wage of the employee in that work setting.

* This address is a central HR address for each employer. If an employer has multiple facilities it is not possible to determine the location of the employee from this address.

Quarterly Workforce Indicators

The Quarterly Workforce Indicators (QWI) are a set of indicators developed by the US Census Bureau to provide local labor market statistics by industry, worker demographics, employer age and size. At the national level, these indicators are calculated from state level unemployment insurance data matched to census data at a point in time. By matching health profession license data to UI data at the state level, the UMEC can construct all of the QWI's with a specific focus only on individuals possessing a health profession license in the state of Utah. The use of QWI's allows for calculation of a set of workforce demand indicators that have published standardized equations that are used by the Bureau of Labor Statistics as well as state entities to describe workforce conditions by industry across the country. There are 32 indicators that can be calculated. These indicators fall into four categories: Employment, Employment change-individual, Employment Change- Firm and Earnings[17].

Figure 10: Connecting the Data Sources



In addition to the QWI, the number of current open job listings across the state are provided by a service called Help Wanted Online (HWOL) This is a private service contracted by DWS to provide current job listings across the state of Utah by profession. DWS provides HWOL data by profession and region of the state to the UMEC for analysis.

The UMEC conducts supply surveys of licensed health professions in the state at regular

[17] Full documentation of the QWI: https://lehd.ces.census.gov/doc/QWI_101.pdf

intervals. These surveys ask about demographics such as gender and race as well as profession specific information such as zip code of practice location, work setting, specialty, hours worked and patient populations seen. This data is used to calculate the number of FTEs in the workforce in the state. These surveys have typically high response rates (30%-40% of the workforce). However, they can only describe the employment location of those who respond to them. If this survey was incorporated into the process of application and renewal of a professional license and/or made a required part of licensure then location of the workforce by zip code could be described with 100% accuracy.

Just as with the earlier methodology, the MDS recommended variables for Nursing demand are being used as a guide to focus on the Quarterly Workforce Indicators that are most appropriate and considered important to be tracked for nursing. Other indicators could be calculated given direction or priority to do so if they are considered important by policy makers.

Table 7: Nationally Recommended MDS Demand Variables

MDS Variables	**Source (QWI Variable)**
Variable Group 1: Full-Time Equivalent Positions (FTEs) Currently Occupied	(Emp Total), UMEC supply survey- FTEs
Variable Group 2: FTE Vacancies Currently Being Recruited	HWOL- for vacancies
Variable Group 3: Average Full-Time Workers Employed	UI- wages, UMEC supply survey- FTEs
Variable Group 4: Average Part-Time Workers Employed	UI- wages, UMEC supply survey- FTEs
Variable Group 5: Per Diem Workers Employed	No available source data
Variable Group 6: Contract, Agency, and Traveling FTEs	No available source data
Variable Group 7: Employed Workers Leaving Your Organization (Separations)	Beginning-of-Quarter Separations (SepBeg)
Variable Group 8: Number of FTEs the Organization Intends to Employ in One Year	No available source data

Advantages of New Methodology

There are several benefits to this new methodology. First and foremost it allows for automated and consistent reproducible collection of five of the eight recommended MDS nursing demand variable groups as indicated in Table 7 . The methodology also allows for calculation of all QWI variables for any given time period. The UMEC has identified and prepared analysis of seven useful metrics from the QWI calculations and can produce others over time as requested/ necessary.

Table 8: Additional Useful Metrics Currently Available

Metric	**Variable Source (QWI Variable)**
Time with current Employer	Sum of quarters with current employer
All hires in a given time period	Hires All(HirA)
All new hires in a given time period	Hires New (HirN)
How many nurses have retired in a given time period	DOPL Age (over 65) and no longer show up in the UI dataset
Number of new positions created in an organization over a given time period	Firm Job Gains: Counts- Job Creation (FrmJbGn)

Limitations of New Methodology

There are always tradeoffs to be made when changing a study methodology. While a great deal of demand metrics can be generated from existing data, several variables considered valuable to describing nursing demand can't be produced without additional surveying. If these variables are desired by policy makers and nursing workforce stakeholders, the UMEC recommends that a system be established to collect this data in a way that can be automated and replicated at regular intervals, rather than ad hoc sample surveys that end up varying in their consistency and data quality because coordination of participation is difficult to maintain over time.

Another important limitation is the inability to pinpoint the employment location of nurses across the state. None of the available data provides a complete source for employment location. Unemployment data contains the employers central reporting address. In many cases this is not the physical practice address of the nurse. License data contains whatever address is provided by the licensee. It is obvious that some use their home address and others use their employer address on their license. There is currently no way to determine what address to attribute to home or practice. The UNWIC assumes in this analysis that the zip code from the license data is the closest representation to a home address. Our analysis then associates a nurses location and employer to the license address with the assumption that nurses are likely to work within relative close proximity to their home address. UNWIC supply surveys do ask for practice zip code but these surveys only represent a weighted estimate of the workforce. Non-responses must be imputed based on similarity to respondents. A comparison of practice location between license zip code and survey estimates based on reported practice zip code does result in aggregates of the total workforce at the state and county level that are a close match. However, When the data is categorized by employer, practice type, specialty or a lower granularity of geography it becomes less accurate at describing useful aggregates of the location of nurses within these categories.

Calculation of turnovers is done by count of EmployeeID/Employer combinations. If the employer changes then a turnover is added to the count. It is possible that some employer changes are due to the employer changing its name due to ownership change or restructuring of a business entity. An employed nurse would still be at the same job, but would still have a new employer in the dataset. Regardless of this phenomenon, this change would be considered

both a new hire and a turnover and therefore would not ultimately change the relative difference between the two variables. Further exploration of the UI data should be done to assign or obtain a static employer ID that will not change with the change of an employer's name.

The UMEC is currently working to build connections to education data from the Utah System of Higher Education as well as specific education data from nursing education programs across the state to be able to describe employment aspects/ patterns of new graduates. The UMEC plans to integrate analysis of this data into future nursing employer demand reporting.

Table 9: Metrics to be Incorporated in 2021 with Planned Integration of Education Data

Metrics	Requirements
New graduates hired over the last twelve months	Hires New (HirN), License matched to graduation data
Turnover of new graduates	Turnover Stable (TurnOvrS), License match to graduation data
RN education mix	UI connected to graduation data

Other Possible Research For Development

Patterns and Trends for Future Recall Hires

With defined parameters for a timeframe of importance we can also begin to investigate how much the quarterly changes are moving toward longitudinal trends or short term responses. In two years when this report is next updated we will be able to use the QWI variable for Hires Recalls (HirR) with the time frame comparison pre to post pandemic to analyze how much the changes that are described in this report within the last couple of quarters have remained or if things have returned to the same pattern we've seen over the most immediate 5 year time period.

License by Endorsement vs Examination

With passage of S.B. 23 in 2020 creating section 58-1-302 (license by endorsement within the Division of Occupational and Professional Licensing Act), the UMEC has requested that a variable be added to the data that we receive from DOPL indicating whether a license was obtained by endorsement from another state or application in this state. This will allow us to better describe workforce migration trends such as retention of Utah educated nurses and competition for recruitment of nurses from the national workforce to meet the needs of Utah's population.

Seasonal and Qualitative Factor Monitoring

Creation of a system to allow employers to report seasonally changing subjective and qualitative information about the nursing workforce, not available from the UI data, would allow for production of additional analysis on a regular basis including the remaining three MDS variables to describe state nursing employment demand patterns[18]. The UNWIC staff have the knowledge to build and maintain such a system given the time and resources to do so.

[18] The Washington State Sentinal Network is such a reporting system in current operation. Information can be found at http://wa.sentinelnetwork.org

Table 10: Additional Valuable Information for Possible Collection from Seasonal Employer Reporting

Hiring freezes
Layoffs during the last year
Recruitment/retention strategies
Foreign recruitment
Time to fill vacant positions by position type and clinical specialty
Use of per diem, contract, agency and traveling nurses
Nursing budget expenditures for recruiting
Nursing budget expenditures for temporary staffing
Nursing budget expenditures for overtime
Impact of nursing shortage on facility
Perception of the nursing shortage / staffing adequacy at facility
Opinions on population health based workforce need
Number of FTEs the organization intends to employ into the future

Conclusion

This analysis has described typical patterns in employment demand for Utah's RN workforce over the last 5 years. Future updates to the analysis will occur bi-annually in conjunction with the RN license cycle as requested in statute. Special attention must be paid immediately to the impact of the Covid-19 pandemic on the State's RN workforce. Serious impacts in terms of reduced job listings, lower new hires and higher turnovers have occurred in recent quarters. Potential for development of further analysis and metrics exists as progress is made toward connection of existing data sets to the current dataset. The analysis has been built to be scalable to any health workforce profession that is licensed in the State of Utah. More work must be done to improve the quality of the described source data to improve the granularity and power of this analysis to better inform policy making with regard to resource allocation for future workforce development. Additional direction on important metrics to track and the analysis priorities of health policy stakeholders including the legislature, educators and employers would also make this analysis more useful for future decision making. Additional details of the analysis will be available through an interactive dashboard to be published by the Utah Nursing Workforce Information Center at www.nursing-umec.utah.gov. Requests for ad hoc analysis of any of the information presented in this report can be directed to the UNWIC.